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The Impact of Childhood ADHD on Dropping Out of High School in Urban Adolescents/Young Adults

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Abstract

Objective: To examine cognitive and psychosocial factors associated with high school dropout in urban adolescents with and without childhood attention-deficit/hyperactivity disorder (ADHD).

Method: A longitudinal study of 49 adolescents/young adults with childhood ADHD and 44 controls who either dropped-out or graduated from high school were included. Risk factors examined as potential correlates of dropout were intelligence, reading skills, socioeconomic status, marijuana use, and paternal contact.

Results: Lower IQ, reading ability, and SES, frequent marijuana use, and limited paternal contact significantly differentiated dropouts from graduates, irrespective of childhood ADHD. Follow-up analyses determined that IQ, marijuana use and paternal contact independently contributed to the likelihood of dropout.

Conclusion: Selected cognitive and psychosocial factors appear independently associated with the likelihood of high school dropout irrespective of ADHD. Notably, childhood ADHD did not increase this risk, suggesting previous reports of increased dropout due to ADHD may become negated in urban areas when matched with similar community controls.

High school students who withdraw early from school are at a considerable disadvantage compared to students who graduate with a diploma. The monetary cost to society (e.g., increased need for public assistance or incarceration) of a single high school dropout has been conservatively estimated to be approximately $388,000 across the lifetime (Cohen, 1998). In 2002, the U.S. Census Bureau issued a special report indicating that high school dropouts earn $7000 less per year than those with a high school diploma, and $26,500 less per year than college graduates (U.S. Bureau of the Census, 2002). The trajectory of this financial discrepancy further indicates that college graduates with at least a bachelor's degree will earn approximately $1.1 million more than high school dropouts across the lifespan. Therefore, prevention of dropping out of high school is of considerable public health importance and determining why adolescents dropout is crucial to the development of strategies aimed at promoting graduation.

It is clear that some adolescents are at a greater risk than others for dropping out. For instance, rates of dropout from high school are generally higher in urban areas than in most other parts of the country (Lever et al., 2004). For example, in New York City in 2004, only 53% of students graduated with a high school diploma or equivalent within four years of their initial enrollment in high school (New York City Department of Education, 2005). Similar numbers were seen in Los Angeles during this period, with only 45% of high school students graduating

with a diploma on time (Swanson, 2005). In contrast, more rural and suburban areas such as Fairfax County, Virginia (87% graduation rate) and Jordan, Utah (80% graduation rate) tend to have lower dropout rates (Greene, 2002). Geographic disposition is often confounded by socioeconomic status (SES), which itself is strongly associated with dropping out (National Center for Education Statistics, 1996).

Various other circumstances can influence youth to dropout. Some factors are extrinsic to the individual, including a variety of systems issues related to educational programming. As an example, whether state or city funding of educational programs in inner cities is sufficient to maintain adequate educational resources could have a large impact on dropout (National Center for Education Statistics, 1996). Other factors are more intrinsic to the individual. For example, low academic skill level (Cairns, Cairns, & Neckerman, 1989) and poor school attendance (Lever et al., 2004) are both predictive of later academic achievement, or lack thereof. Drug use may also be a factor. In 1999, the U.S. Center for Disease Control reported that as many as 47% of all high school students had used marijuana at least once (Kann et al., 2000), and several studies have found marijuana use to be associated with the likelihood of dropping out (Bray, Zarkin, Ringwalt, & Qi, 2000; Lynskey, Coffey, Degenhardt, Carlin, & Patton, 2003). Marijuana use has also been shown to decrease motivation for obtaining reward (Cherek, Lane, & Dougherty, 2002), which could lead to lack of interest in academic achievement and dropping out. Family factors, which likely combine extrinsic and intrinsic considerations, may also affect the likelihood of dropping out (Sanders, Field, & Diego, 2001; Supplee, Shaw, Hailstones, & Hartman, 2004; Younge, Oetting, & Deffenbacher, 1996). For example, early father involvement can have a positive influence on later educational attainment (Flouri & Buchanan, 2004), and increased father involvement has been positively associated with being well-adjusted to and more successful in school (Flouri & Buchanan, 2003). Parental psychopathology increases risk for dropout as well (Farahati, Marcotte, & Wilcox-Gok, 2003).

Another group of adolescents who may have an increased risk for high school dropout are youth with attention-deficit/hyperactivity disorder (ADHD; Weiss & Hechtman, 1986). Recently, poor scholastic outcome, including school dropout, has even been proposed as the most ubiquitous risk associated with ADHD (DuPaul, Volpe, Jitendra, Lutz, Lorah, & Gruber, 2004). Yet, in addition to dropping out of high school, longitudinal studies of adolescents and young adults who were diagnosed with ADHD in childhood often report a wide variety of negative outcomes during high school and early college years, including academic failure (Barkley, Fischer, Edelbrock, & Smallish, 1990; Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1993; Weiss & Hechtman, 1986), family discord (Barkley et al., 1990; Weiss & Hechtman, 1986), substance abuse (Mannuzza et al., 1993), and antisocial behaviors (Barkley et al., 1990; Fischer, Barkley, Smallish, & Fletcher, 2002; Weiss, Hechtman, Milroy, & Perlman, 1985). Specifically, adolescents with childhood ADHD, compared to their non-ADHD counterparts, are more likely to fail academic subjects (Mannuzza, Klein, & Moulton, 2002), have mothers who are separated or divorced from their biological fathers (Weiss & Hechtman, 1986), and use more marijuana (Weiss & Hechtman, 1986). The above studies have focused on the role of ADHD in these outcomes (Barkley, Fischer, Smallish, & Fletcher, 2004; Weiss & Hechtman, 1986). However, in these and other studies, equivalent or even elevated rates of adverse outcomes have been found in non-ADHD control groups, including alcohol use disorders (Mannuzza et al., 1993), reports of drug-related trouble (Mannuzza, Klein, Bonagura, Konig, & Shenker, 1988), and dropping out of high school (Mannuzza et al., 1988; Murphy, Barkley, & Bush, 2002). Therefore, it is not clear whether having childhood ADHD, per se, increases the risk for dropping out of high school, independent of a variety of other factors.

An essential component to developing successful methods for increasing retention is to identify specific additive risk factors associated with leaving school early. Such a task would be facilitated by examining individuals at heightened risk for dropping out, as well as individuals who are seemingly at less of a risk. The current study was designed to examine a selected group of cognitive and psychosocial factors which have been implicated in failure to complete high school: (a) general intellectual functioning, (b) developmentally appropriate reading ability, (c) socioeconomic status, (d) frequency of marijuana use, and (e) contact with one's biological father. Three key issues examined by this investigation were (a) whether age-matched dropouts and graduates from the same major urban high school districts differed on these putative risk factors for dropping out, (b) the degree to which ADHD contributes to the likelihood of dropping out *above and beyond* the impact that these factors have on dropout rates in urban youth, and (c) whether putative risk factors have a differential impact on the likelihood of dropping out in youth with and without ADHD. We hypothesized that youth with a documented history of ADHD since childhood would have an increased sensitivity to the influence these factors have on dropping out, compared to demographically similar controls.

Method

Participants

The participants consisted of 93 (91.4% male) racially and ethnically diverse adolescents/young adults (31.2% African-American, 25.8% Caucasian, 31.2% Hispanic, and 11.9% mixed or other ancestry) aged 16 to 21 years (mean age in years = 18.81, *SD* = 1.28). These individuals represent a sub-sample derived from a longitudinal study of adolescents diagnosed with ADHD during childhood (*n* = 178), which includes only those youth who either graduated from or dropped-out of high school. Those who were still in high school (n = 85) at the time of this evaluation were excluded because they potentially could fall in either group. Among the participants, 49 were initially referred to a research protocol investigating ADHD and other disruptive behavioral disorders when they were 7 to 11 years old (Halperin, Newcorn, Kopstein, McKay, Schwartz, Siever et al., 1997). Referral was through local schools and medical care providers. At that time, participants were diagnosed with Axis I disorders by using parent reports on the Diagnostic Interview Schedule for Children (DISC), version 2.1 or 2.3, depending upon when the were recruited (Fisher, Shaffer, Piacentini, Lapkin, Kafantaris, Leonard et al., 1993; Shaffer, Fisher, Dulcan, Davies, Piacentini, Schwab-Stone et al., 1996), and Child Behavior Checklist (Achenbach, 1991). Teacher reports on the IOWA Conners Rating Scale (Loney & Milich, 1982) were also used. All of these participants met criteria for ADHD Combined Type in childhood.

The remaining participants were 44 non-ADHD healthy controls from the community who were recruited during adolescence as part of the follow-up study. Controls were recruited from the same urban communities as the ADHD group using a mixture of methods, although most came through targeted distribution of advertisements in neighborhoods that matched our ADHD sample by zip codes. Controls interested in participating were then asked a series of questions over the telephone to ensure probable eligibility for the study. Controls resembled probands on gender, ethnicity, and SES (all $p > .05$), but with no reported history of ADHD in childhood or adolescence. Evaluators were blind to group membership for the interview. Controls were also excluded if they had any other chronic, serious medical, psychiatric or neurological condition, as was the case for the original ADHD sample. Table 1 summarizes the characteristics of the overall sample.

The majority of the participants in both groups lived in an urban environment within a major metropolitan area. All participants and their parents were English-speaking. All participants were compensated for their time and travel associated with participation. The Institutional Review Boards of Queens College of the City University of New York and the Mount Sinai

School of Medicine approved all procedures. Written informed consent was obtained from all adolescents above the age of 18 years and the parents of those under the age of 18 years. Assent was obtained from youth under the age of 18 years.

Procedure for academic classification

Academic classification (dropout vs. graduate) was based on parent- and self-reports regarding current or past high school status. School status information was further supplemented by examining school records (i.e., transcripts, suspension records) that were collected for most participants. The dropout group included 56 youths (ADHD = 32; control = 24) who left high school without formally graduating. This group also included those pursuing or who had completed a General Education Diploma (GED) or equivalent, but had dropped out at some point nonetheless. This classification method is considered to be the most accurate estimate of true dropout rates (Greene, 2002). The graduate group included 37 students (ADHD = 17; control = 20) who completed their secondary education with an official diploma from a diploma-granting high school.

Cognitive Measures

General cognitive functioning: Wechsler Adult Intelligence Scale, Third Edition (WAIS-III; Wechsler, 1997)—The WAIS-III is a well-normed test with reliable psychometric properties that is strongly associated with general intellectual status. The test measures an array of verbal and non-verbal abilities that generate indices for a number of refined cognitive domains, as well as an overall estimated Full Scale IQ (FSIQ) score. For two participants, we were unable to obtain WAIS-III FSIQ scores at the time of the visit (one youth was deceased and only a caregiver was interviewed, and one youth did not complete that part of the evaluation). We therefore substituted FSIQ scores from the Wechsler Intelligence Scale for Children – Third Edition (WISC-III) for those two participants, which were obtained during childhood. While not a perfect substitute, the WISC-III is considered to be an age-appropriate analog of the WAIS-III, and general intellectual functioning, as assessed by these measures, is relatively stable over the lifetime.

Reading ability: Wechsler Individual Achievement Test, Second Edition (WIAT-II; Wechsler, 2001)—The WIAT-II is a comprehensive achievement test that was used to assess age-based academic skills for oral language processing and mathematics. The Word Reading subtest of the WIAT-II was administered to each participant to examine oral reading ability. The test required participants to read a list of words, increasing in difficulty, aloud to the examiner as quickly as possible. For the youth who was deceased, the standardized WIAT reading score from childhood was substituted.

Psychosocial Measures

Family and socio-demographic information—Trained graduate students interviewed participants and a parent or guardian about their family environment and family risk factors using a semi-structured demographic interview designed specifically for this study. As part of the interview, they were asked to report the amount of contact that the youth had with his or her biological father (ranging from ‘no contact’ to ‘daily contact’), as well as parental occupation and education, which was used to probe SES determinants. This latter information was then quantified with the socioeconomic prestige scale from Nakao and Treas (1994). The SES range for this scale is 20 to 96, with higher scores indicating increasing socioeconomic prestige and putative income. The mean SES score for the current study was 42.28 (*SD* = 16.52), indicating on average a lower-to-middle status group, although the full range of scores was nearly represented (20 to 83). The modal score in our sample was 20 (*n* = 18, 19.4%), which is the quantitative value given to persons unemployed or on welfare.

Marijuana use: Rutgers Drug and Alcohol Questionnaire (RDAQ; Labouvie, Bates, & Pandina, 1997)—*The RDAQ* was administered directly to the youth in private to determine the frequency of marijuana and other substance use over the past year (ranging from 'no use at all' to 'using multiple times every day'). To protect confidentiality and facilitate honest responding, we obtained a Certificate of Confidentiality for this research from the National Institute of Mental Health. In addition, we validated the reporting of recent substance use by having all participants complete a urinalysis panel for traces of tetrahydrocannabinol (THC) for marijuana, plus cocaine, amphetamine and morphine (Varian Inc., Lake Forest, CA.). Only one subject who denied having used marijuana over the past year had a toxicology report that was positive for THC; that data point was excluded from the analysis.

Statistical Procedures

Five dependent measures (FSIQ, Word Reading, SES, marijuana use, and paternal contact with youth) were submitted to a Group (ADHD vs. control) × School status (dropout vs. graduate) multivariate analyses of variance (MANOVA). A significant main effect for Group, with the ADHD group on the negative side of the outcome, would be in accordance with much of the literature suggesting greater cognitive and psychosocial impairment in ADHD. A significant main effect for School status, reflecting greater impairment in dropouts, would support our hypothesis that these particular risk factors are associated with school failure. Lastly, our primary hypothesis that adolescents with a documented history of ADHD would have an increased sensitivity to the influence these factors have on dropping out relative to controls would be supported by a significant Group × School status interaction. Effect sizes from the MANOVA analysis are reported using partial eta squared (η_p^2), which is the proportion of variability in the dependent variable attributable to a factor. Stepwise logistic regression was undertaken subsequent to the MANOVA analysis to determine which, if any, of the risk factors uniquely contributed to the likelihood of dropping out, after controlling for the other factors. All risk factors were included as independent variables, and the dependent variable was dichotomous (0 = non-dropout, 1 = dropout). In terms of effect size, the relative influence each significant factor had on dropping out was determined by transforming the absolute value of the standardized regression coefficient (β) for each factor into an odds ratio (OR) using the transformation $100(e^{\beta} - 1)$, which was then expressed as an increase in the odds of dropping out given a one unit change in that factor (Allison, 1999). For all statistical tests, results were considered to be significant if $p < .05$, except when this value was adjusted downward for multiple comparisons to decrease the probability of making a Type I error.

Results

Group Differences in Cognitive and Psychosocial Functioning

Omnibus test results from the MANOVA yielded a significant main effect for School status (Wilks' $\Lambda = .453$, $F = 20.503$, $p < .001$, $\eta_p^2 = .547$), but not for Group (Wilks' $\Lambda = .916$, $F = 1.566$, $p = .179$, $\eta_p^2 = .084$). Further, Group differences in risk factors did not systematically vary as a function of School status, such that there was not a significant omnibus Group × School Status interaction (Wilks' $\Lambda = .960$, $F = .703$, $p = .623$, $\eta_p^2 = .040$). Table 2 shows the comparisons of each dependent variable as a function of School status, indicating that those who dropped out of school on average had significantly lower FSIQ scores (19.42 points lower) and reading ability scores (18.09 points lower). Further, dropouts came from lower socioeconomic backgrounds (17.93 points lower) and had more limited contact with their biological father (1.49 points lower). Dropouts also used marijuana much more often (average use = once per week) than graduates (average use = several days per year). Table 2 also shows the comparative extent to which these findings emerged regardless of whether or not childhood ADHD was present.

Independent Links to Dropout

Results from the logistic regression analysis revealed that three of the five risk factors were significantly associated with dropping out after controlling for the other variables. As Table 3 indicates, FSIQ (OR = 7.3, $p < .001$), frequency of marijuana use (OR = 3.2, $p = .002$) and amount of contact with father (OR = 2.4, $p = .012$) were independently related to dropout, controlling for the other factors. On the other hand, WIAT-II reading score and SES ($P > .10$) were not significantly associated with dropout independently. In terms of relative influence on dropout, a one-unit decrease in the amount of contact youth had with their biological father would increase the odds of dropout by a factor of 2.36, controlling for other variables in the model. A one-unit increase in frequency of marijuana use would increase the odds of dropout by a factor of 3.22. Lastly, a one-unit decrease in FSIQ score would increase the odds of dropout by a factor of 7.34, controlling for all other risk factors in the model.

Secondary Analysis: Participants Still Enrolled in School

As part of our larger follow-up study, we evaluated an additional 85 participants (ADHD = 44, control = 41) who were still enrolled in school and working toward a diploma in a diploma-granting high school at the time of assessment. Thus, they were precluded from classification as dropouts or graduates at the time of evaluation because they could potentially fall into either group in the future. Though not part of the primary analyses described above, we assumed that this subgroup, which presumably consists of both eventual graduates and dropouts, would fall in between the two primary groups on most measures of putative risk factors. If true, this secondary analysis would provide support for the hypothesis that differences within these factors are prognostic of academic success (as defined by graduation from high school). However, we present the data descriptively rather than inferentially to avoid over-interpretation of significance values since we have already tested multiple statistical hypotheses within this dataset.

As expected, those still in school were younger than both dropouts and graduates (ADHD mean age of 16.80, *SD* = .77 years; control mean age of 16.88, *SD* = .87 years). They were positioned in between dropouts and graduates on SES, FSIQ and reading scores. The enrolled subgroup used slightly more marijuana than graduates but much less than dropouts, and had nearly the same amount of father contact as graduates (both more than dropouts). Figure 1 shows the standardized values (*z* scores) of both the cognitive and psychosocial factors, and the relative ranking of the enrolled group compared to graduates and dropouts.

Discussion

As compared to those who graduated, urban high school dropouts, regardless of whether they had childhood ADHD, had significantly lower scores on estimated measures of general cognitive functioning and reading ability, came from more disadvantaged socioeconomic backgrounds, used marijuana on a regular basis over the past year, and had more limited contact with their biological fathers. Strikingly, and in contrast to our hypothesis, none of these factors differentially influenced the risk of dropout in adolescents with childhood ADHD as compared to controls who never have had ADHD. Logistic regression further indicated that among risk factors, both cognitive and psychosocial factors made unique contributions to the likelihood of dropping out. Thus, not only do cognitive ability, marijuana use and paternal involvement appear to independently increase risk for high school dropout, but their effects seem to be additive. In this study, FSIQ was moderately related to drug use and father contact, whereas drug use and father contact were unrelated. Socioeconomic status and reading ability did not contribute to dropout once the other variables were entered.

Notably, this study was not designed to compare dropout rates between ADHD adolescents and controls per se due to the fact that many of the potential participants in the study were still in school. Assessment of such rates would be prone to considerable error. While there was a trend towards increased dropouts among those with ADHD (nearly 1.9 dropouts to every one graduate with childhood ADHD; in controls, nearly 1.2 dropouts to every one graduate), we cannot definitively say that, within our study, childhood ADHD increased the risk for dropping out of high school.

The results of this follow-up study are unique to the existing literature on the heterogeneity of ADHD outcomes in adolescence in that we examined the potential influence of important additive cognitive and psychosocial factors associated with the disorder that also contribute to the likelihood of dropping out of high school. By utilizing a demographically similar control group that was well-matched to the clinical group with regard to SES and general cognitive ability, we were able to determine the relative impact that these risk factors have on school completion in an urban population of adolescents/young adults with and without documented childhood psychopathology. This is important since it has been shown that regardless of disability, many urban minority males who are from the lower end of the socioeconomic spectrum tend to encompass the majority of dropout populations (Scanlon & Mellard, 2002). Consistent with this, the adolescents with childhood ADHD were not more sensitive to the negative impact of the additive risk factors. This suggests that previous findings (Weiss & Hechtman, 1986) of elevated rates of dropout among those with childhood ADHD may not have been due to ADHD per se. Rather, group differences may have been due to the fact that, as compared to controls, the group with ADHD had higher rates of these comorbid risk factors as well. It is not uncommon for studies to report lower FSIQ (Doyle, Biederman, Seidman, Weber, & Faraone, 2000; Faraone et al., 1993) and reading scores (Faraone et al., 1993), more limited paternal contact (Barkley et al., 1990), lower SES (Mannuzza et al., 1993), and increased substance use (Mannuzza et al., 1993) among individuals with ADHD as compared to controls.

More importantly, perhaps, is that these other studies differed from the current study on key race/ethnicity and SES variables known to contribute to dropping out (Scanlon & Mellard, 2002). Our sample is highly ethnically diverse (only 26% Caucasian) with numerous families near the bottom of the SES spectrum, whereas the majority of participants in the other studies (e.g., Mannuzza et al., 1988; Weiss et al., 1985) were predominately Caucasian and generally from higher SES backgrounds. The fact that we had such a high background rate of dropout in our sample (31% overall) was not so different from what the general dropout rate has been for schools in the areas from which the participants were drawn (25%), or from similar urban areas (e.g., 55% dropout rate in Los Angeles; Swanson, 2005). It is important to note, however, that while the findings here may not be true of other SES groups, at least one other study with a different SES pool has reported similar findings regarding the predictability of academic outcomes in ADHD such that childhood IQ predicted later academic achievement (Fischer, Barkley, Fletcher, & Smallish, 1993). Thus, the discontinuity within SES on dropout rates in ADHD needs to be further explored.

This study was somewhat limited by a small sample size which was in part due to the fact that a substantial proportion of the youths were still in school. This decreased the available statistical power, which forced us to use MANOVA as our primary statistical approach as opposed to structural equation modeling. Nevertheless, using this approach, the effect sizes suggest that even if a greater number of participants were included in the analyses, most non-significant findings would not appreciably change. While it would have been advantageous perhaps to wait and re-evaluate the sample at a later date when all would have reached the age at which they would either graduate or dropout, the highly mobile nature of this urban sample makes it worrisome that many would be lost to follow-up. Perhaps more importantly is the fact that the

predictor variables were assessed concurrently rather than in childhood. It would have been advantageous to examine the stability of these factors from childhood into adolescence, but unfortunately the control group was not recruited into the study until the age of 16.

It is important to emphasize the point that the aim of this study was to examine the relative influence that specific risk factors have on dropping out and not whether dropping out is more common in adolescents with childhood ADHD than in controls. In order to answer this latter question, we would have to wait for all participants to either complete or drop-out of high school. More importantly, an epidemiologically-sound, community-based sample would be required to truly determine whether youth with ADHD are more prone to drop-out, not a clinically-referred sample such as ours.

This study indicates the need for examination of risk factors other than ADHD in attempting to identify youth at risk for poor academic outcome in adolescence in an at-risk urban population. When tailoring preventative strategies for educational failure in youth from lower-status urban areas, it may be necessary to focus on these additional risk factors, as they seem to contribute substantially to the probability of dropping out. This is likely due to the added negative influence that less stable family environments and increased drug use adds to youth living in inner-city areas. Despite this risk, it has been shown that participation in early childhood educational and family support interventions for low-income, inner-city preschool students is significantly associated with reduced school dropout rates during adolescence and early adulthood (Reynolds, Temple, Robertson, & Mann, 2001). Future longitudinal protocols examining ADHD and other developmental disorders should incorporate similar procedures (i.e., examining additive risk factors) in order to determine the degree to which pathology alone contributes to adolescent outcome.

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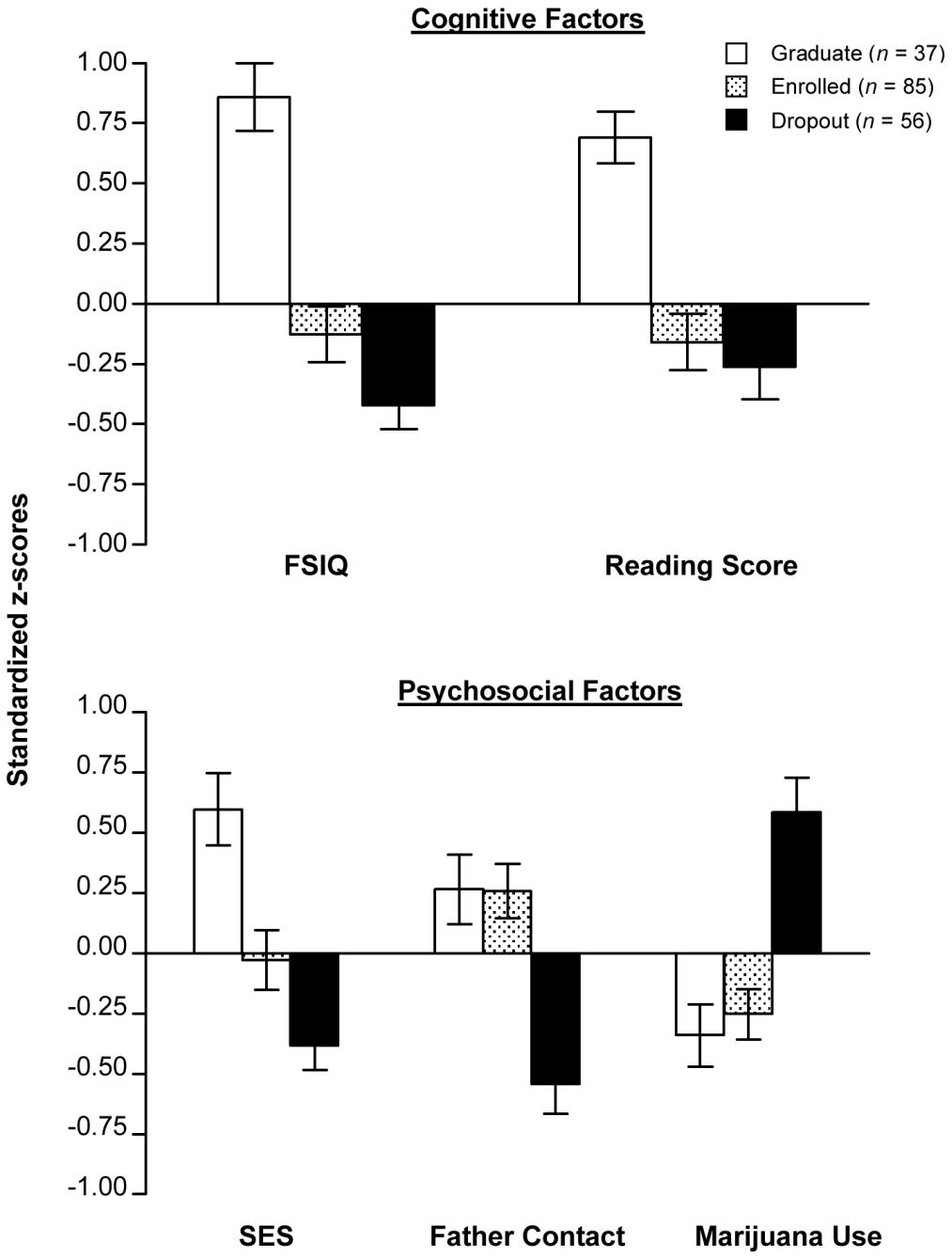

Figure 1.

Relative standing of ADHD and control participants still enrolled in school on the five dependent measures.

Note. Scores represent mean (±*SE*) standardized *z*-scores. Except for Marijuana Use, values in the positive direction indicate the most advantageous scores.

Table 1

Demographic Characteristics and Severity of Disruptive Behavioral Problems

Variable	ADHD (*n* = 49) *M (SD)*	Control (*n* = 44) *M (SD)*	*t*
Age (years)[a]	18.59 (1.1)	19.05 (1.4)	1.73
Socioeconomic status[b]	43.39 (15.7)	41.05 (17.5)	−0.68
WAIS-III Full Scale IQ[c]	94.78 (15.1)	96.36 (14.8)	0.51
ADHD checklist			
Self-report	16.40 (12.7)	3.91 (4.6)	−6.14**
Parent-report	23.00 (16.6)	5.30 (7.6)	−6.47**
CBCL Externalizing scale[d]	62.20 (13.9)	48.43 (11.9)	−4.90**
YSR Externalizing scale[d]	59.07 (13.1)	46.32 (9.3)	−5.08**

[a] Range = 16 to 21 years old.

[b] range = 20 (*low SES*) to 83 (*high SES*).

[c] range = 62 (*extremely low*) to 143 (*very superior*)

[d] Scores obtained from Achenbach (2001) Child Behavior Checklist (CBCL) and Youth Self-Report (YSR).

** $p < .01$.

Table 2

High School Dropouts vs. Graduates on Cognitive and Psychosocial Measures Relative to Childhood ADHD Status

Risk Factor	Dropouts		Graduates		*F*	*p*	η_p^2
	ADHD (*n* = 32)	Control (*n* = 24)	ADHD (*n* = 17)	Control (*n* = 20)			
WAIS-III FSIQ	87.84 (11.00)	87.79 (10.24)	107.82 (12.95)	106.65 (12.91)	61.49	< .001	.409
WIAT-II Reading Score	83.09 (21.64)	92.79 (14.19)	106.53 (9.07)	105.55 (14.59)	26.18	< .001	.227
Socioeconomic Status	37.34 (11.27)	32.67 (14.91)	54.76 (16.78)	51.10 (15.12)	35.18	< .001	.283
Paternal Contact[a]	2.34 (1.68)	1.67 (1.24)	3.65 (1.69)	3.35 (1.42)	21.10	< .001	.192
Marijuana Use[b]	6.50 (3.81)	6.17 (3.74)	3.35 (3.02)	2.85 (2.82)	20.26	< .001	.185

Note: Scores indicate mean (*SD*). *F* and *p* values indicate a significant main effect for School status (dropout vs. graduate). There were no significant omnibus or univariate effects for Group or Group × School status interactions.

[a] Range from 1 (*no contact*) to 5 (*daily contact*).

[b] Range from 1 (*did not use*) to 10 (*used more than once per day*).

Table 3

Logistic Regression Results Showing Significant Independent Associations with Dropout

Step/variable	β	*SE*	*z*	*p*	OR	CI (95%)
I. Full Scale IQ	2.08	.433	23.14	< .001	8.02	3.44-18.75
II. Full Scale IQ	2.18	.284	19.36	< .001	8.83	3.35-23.29
Marijuana use	.996	.333	8.94	.003	2.71	1.41-5.20
III. Full Scale IQ	1.99	.490	16.54	< .001	7.34	2.81-19.19
Marijuana use	1.17	.382	9.37	.002	3.22	1.52-6.80
Paternal contact	.859	.341	6.33	.012	2.36	1.21-4.61

Note. The above model included all 5 risk factors using the Wald forward stepwise method. WIAT-II reading score and SES didnot reach statistical significance on any step; (I = step 1; II = step 2; III = step 3). β = regression coefficient; *SE* = standard error; *z* = standardized Wald score; *p* = probability value for *z* score; OR = odds ratio; CI = 95% confidence interval for the odds ratio.